

UNUSUAL CARE OF ANTS FOR APHIDES.

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WHILE collecting leaf-fungi on *Andromeda ligustrina*, in a sphagnum swamp at Wood's Holl, Mass., in the early part of September 1881, my attention was attracted by a small, rough mass, apparently of dried sphagnum, surrounding one of the twigs, at a distance of about a metre and a half above the ground. Curious to know how it had reached that unusual place, and what it really was, I went to it, and on closer examination found it to be a shelter erected by a colony of about a dozen worker ants over a numerous herd of small wingless brown aphides, which feed on the sap of this plant.

The twig on which the nest was placed had a diameter of about 3 mm., branched once at the top, and again at about 8 mm. from the bottom of the nest; between these branchlets a single leaf was given off. The nest was 3 cm. long, 1.3 cm. broad at the largest part, near the middle, tapering somewhat toward each end, where it was quite abruptly rounded off, running down the stem in a thin, solid layer for a very short distance. The wall, which had an average thickness of about 0.5 mm., also ran out in the same way, where the branchlets passed through. These decurrent portions formed the only support of the structure, which thus enclosed a capacious chamber surrounding the twig. On the inner surface, so far as seen, the wall was carefully smoothed off; the outer surface was

quite irregular and rough. A small round opening existed at each end. That at the top was 3 mm. in diameter; the lower one was very minute, having a diameter of less than 1 mm. As I have said, the nest at first sight appeared to consist of dry bog-moss; a microscopic examination, however, showed the material to be chiefly small fragments of wood—evidently obtained from an old log lying at the foot of the shrub—with small quantities of the leaf-fragments of mosses and phaenogams, the whole apparently glued together by the saliva of the ants.

At first, neither ants nor aphides were visible, but on jarring the plant slightly, I saw the head of an ant protruded from the larger entrance, the antennae of another appearing simultaneously at the smaller. With the point of a penknife I now enlarged the latter opening, upon which several ants rushed out furiously, and two or three swarmed upon my finger which was in contact with the twig, trying to bite and sting it. The ant at the upper opening also came out, followed by one or two others, but these apparently failed to locate the disturbance, and soon reëntered the nest, as did those from below which had not touched my finger. Those upon my finger were not allowed to return to the nest, and the excitement was of short duration. Through the enlarged opening, which was from time to time curiously examined by some of the ants, I could

see the aphides, crowded quite closely, receiving the caresses of their protectors, and, as usual, rewarding them with an abundance of honey-dew.

Thinking to watch them a little more, I removed the branch bearing the colony to my room, and placed it in a vase of water which was kept standing in a shallow dish filled with water. While I was carrying them home, the ants at first seemed considerably disturbed by the motion, and quite frequently came out singly or in groups of two or three, ran about, exploring the leaves and smaller twigs, and then commonly returned to the nest and reentered it as if satisfied. Occasionally one reached my hand and then showed the same fury manifested on the first disturbance, but care was taken to prevent the return of these, and the others soon ceased to notice the unusual motion. After they were safely placed in my room, the cessation of the motion produced much the same excitement as its commencement; but, like the first, this did not last long. For a short time the ants seemed restless in their new quarters, and scouts occasionally explored the twigs and leaves, sometimes going on the vase and as far as to the water in which it stood; but so far as could be seen, these were all content to return. Rarely one would go to the water as if to drink, and then return to the nest; and I am positive that some individuals never left the nest. In this way I kept them for about two weeks, in which time the leaves had partially dried, and, their food being less abundant, some of the aphides left the shelter and moved to better parts of the

branch, but they still obtained enough food to produce a considerable quantity of honey-dew, and were followed by some of the ants, whose attentions were constant. Once in a while I would find one of the ants or aphides drowned in the water below, but it always appeared that it had fallen from the branch, and had not been drowned in attempting to leave the colony. Finally the remainder were put in alcohol. The ants proved to be workers of *Crematogaster lineolata* Say; not having winged individuals, I did not attempt to identify the aphides. Both, with the nest, have been placed in the biological collection of the Museum of Comparative Zoology at Cambridge, Mass.

The architecture of ants, in a number of forms, is matter of every-day observation, their nests and covered ways often being seen. That they frequently take their wards, the aphides and coccids, into their nests is sufficiently well known, whether these nests are in hollow plants (*Cecropia*), beneath stones, or in the ground; but this is the first case that has come under my observation in which a species has erected a shelter over aphides in a place not commonly chosen for its nesting. In structure and composition, the nest I have described is not unlike those formed by the same species upon fallen logs and in similar situations. Here, however, from their entire behavior, I am led to believe that they had taken up their residence at a considerable distance from the ground, and, obtaining food and drink from their herd, remained constantly upon the plant, seldom leaving the immediate vicinity of the nest.